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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. |
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09/614,682 07/12/00 SUMMERS

G 79,812

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| EXAMINER |
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NAVAL RESEARCH LABORATORY
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WASHINGTON DC 20375-5320

MM91/0710
CODE 1008.2

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| NGUYEN, J | |
| ART UNIT | PAPER NUMBER |

2815

DATE MAILED:

07/10/01

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Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/614,682

Applicant(s)

SUMMERS ET AL.

Examiner

Joseph Nguyen

Art Unit

2815

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-11 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claims 1 and 7, it is not understood what it is applicant regards as "the negative voltage" because the negative voltage is not defined with respect to any other regions. Note that only difference in voltage potential can be measured. No reference potential has been defined.

Regarding claim 2, it is not understood what it is applicant regards as "negative back bias greater than zero". How can a negative back bias be greater than zero? ✓

Claims 3-6 and 8-11 are also rejected due to their dependency upon the rejected base claims 1 and 7 above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-6 and 7-11 are rejected under 35 U.S.C. 102(b) as being anticipated by
Terrill et al.

Regarding claim 1, Terrill et al discloses a CMOS or NMOS having one n channel disposed on the substrate 6A, the device being resistant to total dose radiation failures, the device further comprising a negative voltage source Vbg, for applying a steady negative back bias to said substrate 6A to mitigate leakage current in said device, thereby mitigating total dose radiation effects. This is all illustrated in figure 2.

Regarding claim 2, consistence with the disclosure of the instant invention, the value of the back bias is disclosed by Terrill et al. This is all illustrated in figure 2

Regarding claim 3, Terrill et al further discloses that back bias is between about -5 V to -0.1 V (col. 5, lines 5-7).

Regarding claim 4, Terrill et al further discloses that back bias is between about -3 V and -1 V (col. 4, lines 26-28).

Regarding claim 5, Terrill et al further discloses that CMOS device is engineered to have a threshold voltage within a selected operating range while said steady negative voltage is applied. This is all illustrated in figure 6.

Regarding claim 6, Terrill et al further discloses that operating range of device is between 0 V and 0.8 V (col. 5, lines 4-7).

Regarding claims 7-11, the steps recited in these claims are anticipated for the same reason provided in the rejection of claims 1-6 above.

Claims 1 and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by Oashi et al.

Regarding claim 1, Oashi et al discloses a CMOS or NMOS having one n channel disposed on the substrate, the device being resistant to total dose radiation failures, the device further comprising a negative voltage source V_{sub} , for applying a steady negative back bias to said substrate to mitigate leakage current in said device, thereby mitigating total dose radiation effects. This is all illustrated in figure 8.

Regarding claim 7, the steps recited in claim 7 are anticipated for the same reason provided in the rejection of claim 1 above.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

US Patent 5289025 to Lee discloses that an n channel MOS transistor connected to a node boosted below the negative power supply level.

US Patent 5521524 to Houston discloses that the circuit having a plurality of transistors and coupled to a supply voltage node, a reference node and a substrate node.

US Patent 4460835 to Mansuoka discloses that a depletion type transistor providing sufficient current with a first back gate bias given in an active mode.

US Patent 6121651 to Furukawa et al discloses that a DRAM device having reduced leakage current and a process of manufacturing the same.

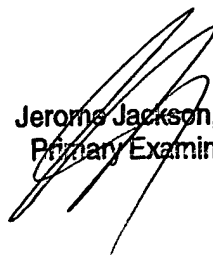
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph Nguyen whose telephone number is (703) 308-1269. The examiner can normally be reached on Monday-Friday, 7:30 am- 4:30 pm

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned is (703) 308-7382 for regular communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

JN
July 5, 2001



Jerome Jackson, Jr.
Primary Examiner